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(19)

(54) FLAVOURING AGENT

(71) We, PFIZER LIMITED, a British Company of Ramsgate Road, Sandwich, Kent, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to flavouring agents and particularly to agents for imparting a meat flavour to protein compositions, especially textured vegetable proteins. The invention is also concerned with flavoured protein compositions, particularly flavoured textured vegetable protein compositions, which have been flavoured with the said flavouring agents.

United Kingdom Patent Specification No. 1082504 describes and claims a process for preparing a beef-flavoured substance which comprises heating in admixture, a hexose or pentose monosaccharide with cysteine, in the presence of water, until a beef-flavoured mixture is obtained, adding for each part by weight of said beef-flavoured mixture from 5 to 15 parts of vegetable protein hydrolysate and from 0.5 to 1.5 parts of a 5'-ribonucleotide and heating for about 2 hours at at least 70°C. United Kingdom Patent Specification No. 1135123, which is a Patent of Addition to No. 1082504, describes and claims a similar process and includes the use of cystine as the amino acid.

It has now been found that a process similar to that disclosed in Specifications 1082504 and 1135123, and in the corresponding United States Specification 3365306, but involving the reaction of supplemented plasteins with monosaccharides provides improved meat flavour compositions.

Plasteins are protein-like high molecular weight compounds and the plasteins which have been found to be advantageous for the production of flavouring agents are those which have been supplemented with sulphur containing amino acids, for example methionine or cysteine. Since the presence of low molecular weight peptides or free amino acids may lead to off flavours they may optionally be removed by, for example, dialysis or fractional precipitation.

Meat flavours are formed by the reaction of these supplemented plasteins with monosaccharides (hexose or pentose) in water at elevated temperature, this type of reaction being known as the Maillard reaction. The flavour may be modified by the addition of monosodium glutamate, before reaction with the monosaccharide.

Accordingly the present invention provides a process for the preparation of a flavouring agent which comprises mixing together one part by weight of a hexose or pentose monosaccharide and from 1 to 20 parts by weight, preferably from 4 to 10 parts by weight, of a plastein supplemented with a sulphur-containing amino acid, and heating the mixture in the presence of water at a temperature within the range of 80°C to 120°C. If desired, the flavour may be further improved by including monosodium glutamate in the mixture, preferably before heating.

Preferably, the heating is conducted for at least four hours at 100°C, although the heating period may be correspondingly shorter or longer at higher or lower temperatures respectively. When conducting the reaction at a temperature at the upper end of the specified range, i.e. above 100°C, it will clearly be necessary to operate under an elevated pressure.

It has been found in accordance with the invention that the heating period necessary to complete the reaction varies according to the monosaccharide used. For example, a hexose (such as glucose) requires a period of at least 20 hours at 100° or at least 5 hours at 120° (under elevated pressure), while a pentose (such ribose) requires only 4 hours at 100° or 1 hour at 120°.

As already mentioned, the preferred ratio (by weight) of monosaccharide to plastein is in the range from 1:4 to 1:10, and it has been found in accordance with the invention that ratios less than 1:10 impart rather weak flavours to protein compositions in which the

flavouring agent is incorporated. As the ratio is increased to greater than 1:10, undesirable off-flavours begin to appear in such compositions, but these only become strong at ratios greater than 1:4. Thus the optimum ratio is 1:10.

The monosodium glutamate may be included in the mixture at ratios of one part to from one to ten parts by weight of plastein, preferably one part to five parts by weight of plastein. At a ratio of less than 1:5 the flavour improvement is rather weak, while at ratios above 1:5 little further advantage is obtained.

The water content of the mixture is also important for flavour and quality and depends on the monosaccharide used. The amount of water present should in all cases be sufficient to provide at least two parts by weight of water for each part of supplemented plastein. With a pentose (such as ribose) improvement in flavour quality increases with amounts of water up to five parts by weight of water per part by weight of supplemented plastein, but further increasing the amount of water, although not deleterious as to flavour quality, merely dilutes the product. The preferred ratio of water to supplemented plastein when a pentose is used is therefore about 5:1. With a hexose (such as glucose), however, improvement in flavour quality continues with increasing amounts of water up to twenty parts by weight of water. The preferred ratio of water to supplemented plastein when a hexose is used is therefore about 20:1.

Since the optimum ratio of plastein to monosaccharide is about 10:1 and the preferred ratio of supplemented plastein to monosodium glutamate is about 5:1, the preferred water content of the total mixture before heating, when a pentose is used, is 5 parts by weight of water in 6.3 parts of the mixture, i.e. about 80% water by weight, and when a hexose is used, is 20 parts by weight of water in 21.3 parts of the mixture, i.e. about 94% water by weight.

The invention also provides a flavouring agent whenever prepared by the above process.

The supplemented plastein used in the process of this invention may be prepared initially from a hydrolysed protein, e.g. a digest derived from soya protein, safflower protein or other vegetable protein, fish protein or microbial protein, such as fungal protein, with a proteolytic enzyme, e.g. pepsin. The hydrolysed protein is concentrated, supplemented with a suitable derivative of a sulphur-containing amino acid, for example, methionine, cysteine, cystine or lanthionine, and the supplemented plastein is then prepared by incubating the hydrolysed protein together with the derivative of the acid, for example an ester or an ester salt thereof, in the presence of a further amount of enzyme under conditions such as to cause polycondensation to occur. The preparation of plastein from hydrolysed protein has been known for a very long time and the conditions for plastein formation are also well known (see, for example, Biochem. J. 1931, *25*, 2003). Supplementation with methionine has also been previously described (J. Agirc. Food Chem., 1971, *19*, 1151).

The product may be either dried as such, for example by freeze-drying, or further treated by dialysis or fractional precipitation e.g. with ethanol, to remove undesirable by-products which might produce off-flavours.

The amount of sulphur-containing amino acid which may be used for supplementing the plastein can vary within wide limits but is normally in the range from 5% to 50% by weight based on the supplemented plastein, preferably 15 to 20%, since lower proportions lead to weaker meat flavours in the ultimate product while proportions greater than 20% can lead to the introduction of off-flavours.

The supplemented plastein prepared as described above is then heated with water and the hexose or pentose monosaccharide for example ribose, glucose or arabinose, and optionally the flavour modifier, for example, monosodium glutamate, to produce a flavouring agent according to the invention. A particular advantage of meat flavours formed from plasteins in this way is their property of being only slowly liberated from protein compositions containing them when the latter are chewed. They are thus useful for flavouring materials requiring a good deal of chewing, such as textured vegetable protein. In such a situation it may be advantageous to supplement the plastein derived meat flavour with a more rapidly released meat flavour which may be of synthetic or natural origin, for example, the beef-flavoured substances of United States Patent No. 3365306 and United Kingdom Patent Nos. 1082504 and 1135123, and the chicken and beef flavoured products marketed by Pfizer Inc., under the Trade Mark "Corral", or they may be of natural origin, for example, natural meat stocks or extracts.

The flavouring agents of the present invention may be incorporated in the finished textured vegetable protein product, together with other meat flavours if desired, by contacting the protein product with an aqueous solution containing the flavouring agents. It has been found, in accordance with a further aspect of the invention, however, that the flavouring agents of the present invention can be incorporated in the texture vegetable protein before it is shaped into its finished form, e.g. by incorporation into the vegetable protein before extrusion at high temperature and pressure, since the flavouring agents of the present invention are not deactivated at the high temperatures and pressures used in such processes, e.g. 150°C at 100 p.s.i.

Accordingly, the present invention further

provides a textured protein composition, especially a meat-flavoured textured vegetable protein composition, which comprises a textured protein, for example a textured vegetable protein, having incorporated therein from 0.1 to 10 per cent by weight, preferably from 0.75 to 6% by weight, of a flavouring agent of the invention, based on the dry weight of textured protein.

The following Examples illustrate the preparation of flavouring agents according to the invention and the production of textured vegetable protein compositions incorporating such flavouring agents. Unless otherwise stated all percentages are by weight and temperature are in °C. In all cases the pepsin used is 1:10,000 grade.

EXAMPLE 1.

(a) *Hydrolysis of Soya Protein.*

A commercial soya protein isolate, "Fujipro" M, is used as starting material. The word "Fujipro" is a registered Trade Mark.

500 g of Fujipro M is dissolved in 22.5 litres of demineralised water and the pH adjusted to 1.60 with hydrochloric acid. The solution is heated to 37° and 5.0 g of pepsin is added, the whole is then incubated at 37° for 40 hours by which time the nitrogen containing material is 98.5% soluble in 10% trichloro-acetic acid (TCA). The mixture is boiled for 15 minutes, adjusted to pH 5.0 with aqueous sodium hydroxide and filtered. The filtrate contains 0.26 g./100 ml. nitrogen of which 99.3% is soluble in 10 %TCA. The filtrate is then concentrated to about 40% protein by evaporation under reduced pressure at 40°C, to give a substrate which is suitable for plastein formation.

(b) *Plastein Formation with Methionine Supplementation.*

50.0 mls. of concentrated peptic digest obtained as in (a) and containing 46.67 g./100 ml. protein with a degree of proteolysis of 99.3% (i.e. 99.3% of nitrogen is soluble in 10% TCA) is mixed with 5.0 g of L-methiodine ethyl ester and the whole is heated to 37° C. 0.25 g of pepsin is added and the whole incubated at 37°C, for 24 hours.

The product may be freeze dried and as such contains 77.1% of its nitrogen soluble in 10% TCA, representing a plastein yield of 20.5% based on the hydrolysed protein plus methionine.

Alternatively, the product may be dialysed against demineralised water for 48 hours, which lowers the amount of TCA soluble nitrogen to 56.2%, and subsequently freeze dried. Either product may be used for flavour formation though the dialysed material is preferable.

(c) *Flavour Agent Formation.*

1.0 g of the dialysed powder prepared above, 0.5 g of ribose and 0.3 g of monosodium glutamate are heated in 10 ml. of water at 100°C. for 4 hours and freeze dried. The resulting product has the flavour of cooked beef.

EXAMPLE 2.

(a) 5 kg. of Fujipro M is suspended in 200 litres of demineralised water and the pH adjusted to 1.6 with 1.4 kg of concentrated hydrochloric acid. The mixture is then heated to 50°, 50 g of pepsin (1:10,000 grade) is added and the whole is heated and stirred at 50° for 4 hours. The temperature is then raised rapidly (in 15 minutes) to 80°, while 40% caustic soda is added to raise the pH to 5.0, and held at 80° for 30 minutes. After cooling overnight, the pH of the mixture is readjusted to 5.0 with caustic soda, thus using a total of 600 g sodium hydroxide. The product is filtered and concentrated to a protein content of about 46% in a final volume of 7 litres. The protein content is 80.2% soluble in TCA, i.e. has a degree of proteolysis of 80.2%, and has an average molecular weight of 1050, as determined by end-group analysis.

(b) To 6.5 litres of the product of (a), containing 3 kg of hydrolysed protein (80.2% soluble in 10% TCA) is added 750 g (25%) DL-methionine ethyl ester and the pH of the solution is adjusted to 4.5 with 300 g of concentrated hydrochloric acid. The solution is then heated to 65°, 4 g of pepsin is added and the whole is maintained at 65° for 24 hours to yield a viscous aqueous paste containing 3.62 kg of plastein. The plastein thus produced has a methionine content of 550 g (15%) and has 45.4% of its nitrogen soluble in 10% TCA (representing a plastein yield of 35%) and an average molecular weight of 5,800.

(c) 800 g of the paste obtained in (b), containing 375 g of plastein, is mixed with 40 g ribose, 80 g monosodium glutamate and 2.0 litres of water, heated under reflux for 4 hours, cooled and made up to 2.5 litres with water. The product is an aqueous solution containing about 20% by weight of a flavouring agent according to the invention, and comprising 15% (g/100 ml) plastein.

EXAMPLE 3.

The procedure of Example 2 is repeated using amounts of DL-methionine ethyl ester in part (b) varying from 150 g to 3 kg (5% to 100% by weight, based on the hydrolysed protein, i.e. about 5 to 50% of the supplemented plastein) with similar results.

EXAMPLE 4.

The procedure of Example 2 is repeated using DL-methionine ethyl ester hydrochloride in part (b) in place of the free ester, with similar results.

EXAMPLE 5.

The procedure of Example 2 is repeated using amounts of ribose varying from 20 g to 200 g, with similar results.

EXAMPLE 6.

The procedure of Example 2 is repeated using glucose or arabinose in place of ribose, and heating under reflux for 20 hours, with similar results.

EXAMPLE 7.

The procedure of Example 2 is repeated using amounts of monosodium glutamate varying from 40 g to 200 g with similar results.

EXAMPLE 8.

The procedure of Example 2 is repeated, except that heating is carried out (under elevated pressure) at a temperature of 120° for 1 hour, with similar results.

EXAMPLE 9.

The procedure of Example 2 is repeated, but using amounts of water varying from 1 litre to 10 litres, with similar results.

EXAMPLE 10.

The procedure of Example 2, parts (a) and (b) is repeated. Suspension of this material in 75 litres of industrial methylated spirit (95.5 ethanol:methanol mixture) and stirring for 2 hours yields an insoluble precipitate which, after filtration and drying *in vacuo*, yields 3.55 kg of a white powder, containing 95% plastein with an average molecular weight of 6,400.

400 g of the final powder product, containing 380 g plastein, is mixed with 40 g ribose, 80 g monosodium glutamate and 2 litres of water, heated at 100° under reflux, cooled and the solution made up to 2.53 litres with water. The product is again an aqueous solution containing about 20% by weight of a flavouring agent according to the invention and comprising 15% (g/100 ml) plastein.

EXAMPLE 11.

The procedure of Example 2, parts (a) and (b), is repeated, followed by suspension of the product in industrial methylated spirit as described in Example 10.

200 g of the final powder product containing 190 g plastein, is mixed with 20 g glucose, 40 g monosodium glutamate and 4 litres of water, heated at 100° for 20 hours, cooled and the solution made up to 5 litres with water. The product is an aqueous solution containing about 5% by weight of a flavouring agent according to the invention, and comprising 3.8% (g/100 ml) plastein.

EXAMPLE 12.

The procedure of Example 11 is repeated, except that heating is carried out (under elevated pressure) at a temperature of 120° for 5 hours, with similar results.

EXAMPLE 13.

Preparation of flavoured, textured vegetable protein.

A mixture of 10 g dry, textured soya protein (produced by extruding wet soya flour or grits under high pressure at a temperature above 100°), 0.1 g of the freeze-dried product of Example 1, and 25 ml of a 10% (g/100 ml) aqueous solution of "Corral" beef flavour paste, are heated in a stoppered tube at 90° for 2 hours. The product, which is a rehydrated, texturised vegetable protein containing the equivalent of 7% "Corral" beef flavour paste and 0.3% of a flavouring agent according to the present invention (based on the wet weight of the product) has the taste and texture of cooked beef and has a long-lasting beef flavour.

A similar product made with "Corral" beef flavour paste alone, without the flavouring agent of the present invention, has a similar flavour which is more quickly lost on chewing and is therefore an inferior product.

"Corral" beef flavour paste is a product sold by Pfizer Inc of New York, New York, United States of America, and is a flavouring composition made in accordance with the disclosure in United States Specification No. 3365306 and United Kingdom Specification No 1135123.

EXAMPLE 14.

One part of dry, textured soya protein product produced as in Example 13 is rehydrated with two parts (by weight) of an aqueous solution of either "Corral" beef (or chicken) flavour paste alone or "Corral" beef (or chicken) flavour paste and a product of one of Examples 2, 10 or 11, to give a flavoured product containing the amounts of flavouring material (or materials) shown in Table I as wt % "Corral" paste or plastein content of product of Example 2, 10 or 11, based on the weight of hydrated product. The flavoured products are compared by a panel of judges in groups of three, one containing only a "Corral" flavour and two containing different proportions of a "Corral" flavour and a flavour of the present invention. The products are scored by the judges for quality of flavour on an arbitrary scale of 100 to 150 and ranked 1st, 2nd or 3rd for persistence of flavour in each group. Table I shows the composition of the three products in each group (A) to (E) together with their flavour scope and the mean value of the ranking order obtained for persistence of flavour.

TABLE I

		(1)	(2)	(3)
(A)	"Corral" beef flavour paste, %	4.5	3.6	2.7
	Product of Example 2, % plastein	0.0	0.5	1.0
	Flavour score	102	116	129
	Mean rank for persistence	2.33	2.00	1.67
(B)	"Corral" beef flavour paste, %	2.8	2.3	1.8
	Product of Example 2, % plastein	0.0	.26	.50
	Flavour score	102	118	121
	Mean rank for persistance	2.50	2.0	1.50
(C)	"Corral" chicken flavour paste, %	4.5	3.6	2.7
	Product of Example 2, % plastein	0.0	0.5	1.1
	Flavour score	116	128	142
	Mean rank for persistence	2.43	1.86	1.71
(D)	"Corral" beef flavour paste, %	4.5	3.6	2.7
	Product of Example 10, % plastein	0.0	0.5	1.1
	Flavour score	112	125	132
	Mean rank for persistence	2.50	1.95	1.55
(E)	"Corral" beef flavour paste, %	4.5	3.6	2.7
	Product of Example 11, % plastein	0.0	1.0	2.0
	Flavour score	102	133	150
	Mean rank for persistence	2.80	1.80	1.40

The results of these tests show that products flavoured with a combination of a "Corral" flavour and a flavouring agent of the present invention not only have an improved flavour compared with products flavoured with "Corral" alone, but also have a greater persistence of flavour on chewing, the degree of persistence increasing with the proportion of flavouring agent according to the present invention. It is also apparent that the products of Examples 2 and 10 (derived from supplemented plastein and ribose) have approximately twice the flavouring strength (weight for weight) of "Corral" paste while that of Example 11 (derived from supplemented plastein and glucose) has an approximately equivalent flavouring strength to "Corral" paste.

EXAMPLE 15.

De-fatted soya grits (10 parts by weight) were contacted with water (2.5 parts by weight) containing in solution the amounts of "Corral" beef flavour paste or a product of one of Examples 2, 10 or 11 shown in Table 11 at wt % "Corral" paste or plastein content of product of Examples 2, 10 or 11, based on the weight of dry product. The hydrated products were then extruded at 130—140° and 1000 p.s.i. to form dry, textured vegetable protein products which were then tested for nature and persistence of flavour. Results are shown in Table II.

TABLE II

Flavouring agents	%	Flavour of product
"Corral" beef favour paste	5.5	soya-like (unflavoured)
"Corral" beef flavour paste	11.0	meaty, non-persistent
Product of Example 2	1.3	meaty, persistent
Product of Example 2	2.6	meaty, persistent
Product of Example 10	2.6	meaty, persistent
Product of Example 11	5.2	meaty, persistent

The results show that the beef flavour of the "Corral" paste only survives the extrusion conditions when a very large amount (11%) of paste is incorporated, whereas amounts of flavouring agents according to the present invention equivalent to 2.6% or 5.2% "Corral" paste result in flavoured extruded products. Moreover, the latter have a persistent flavour on chewing, whereas even the product initially containing 11% "Corral" paste did not impart a persistent flavour to the extruded product on chewing.

EXAMPLE 16.

Dry, textured soya protein product is rehydrated (as in Example 14) with aqueous solutions of "Corral" beef flavour paste, alone or with varying amounts of products of Examples 2, 10 or 11 to give flavoured products containing the amounts of flavour shown in Table III, expressed as wt % plastein content based on the weight of the hydrated product.

TABLE III

Product	Flavouring Agent of Invention	"Corral" beef flavour paste
(A)	–	4.5%
(B)	–	6.0%
(C)	Example 2, 1.0%	2.6%
(D)	Example 2, 1.2%	3.6%
(E)	Example 2, 1.5%	3.6%
(F)	Example 10, 1.0%	2.6%
(G)	Example 11, 2.0%	2.6%

EXAMPLE 17.

De-fatted soya grits (10 parts by weight) are contacted with water (2.5 parts by weight) containing in solution a product of one of Examples 2, 10 or 11, with or without "Corral" beef flavour paste, in the amounts shown in Table IV (as wt % based on the weight of dry product, as in Example 15). The hydrated products are then extruded as in Example 15 and re-hydrated with 20 parts by weight of water containing in solution 0.5 parts by weight of "Corral" beef flavour paste, thereby adding 5% "Corral" beef flavour paste (based on the dry weight of product) to the flavouring agent or agents already present.

TABLE IV

Product	Flavouring Agent of Invention			"Corral" beef flavour paste	
	Example	wt % dry*	wt % wet‡	wt % dry*	wt % wet‡
(H)	2	1.3	0.43	–	1.67
(J)	2	1.3	0.43	3.3	2.77
(K)	10	1.3	0.43	3.3	2.77
(L)	11	2.6	0.87	3.3	2.77
(M)	2	2.6	0.87	–	1.67
(N)	10	2.6	0.87	–	1.67
(P)	11	5.2	1.73	–	1.67
(Q)	–	–	–	–	1.67
(R)	–	–	–	–	3.40

* before extrusion.

‡ after re-hydration, including additional "Corral"

For comparison, extruded products (Q) and (R) are also made by the same method, but in which no flavouring agent is added before extrusion and sufficient "Corral" beef flavour paste is added during re-hydration, to give 1.67% or 3.4% "Corral", respectively, based on the wet weight of the product.

Various pairs of the products (A) to (R) of each of Examples 16 and 17 have been tested for flavour quality and persistence by panels of judges by the "triangular" method, i.e. two samples of one product of each pair and one sample of the other product are submitted to the members of each panel and, if one sample is correctly identified as being different from the other two, then a judgement is made either of the quality or of the persistence of its flavour in comparison with that of the other two.

By this method, it has been found that, for the products of Example 16, product (C) has a significant better quality beef flavour than product (A), with similar flavour strength. Products (D) and (E) also have significantly better quality beef flavours than product (B) with similar flavour strengths. Moreover, product (D) has a significantly more persistent beef flavour on chewing than product (B). Products (F) and (G) also have good quality beef flavours, though that of product (C) is significantly better than than of product (F) and that of product (F) is significantly better than that of product (C).

All the products of Example 17 have beef flavours of good quality and all but products (Q) and (R) have flavours which are persistent on chewing. It has been found, however, that products (H) and (J) have significant better quality flavours than product (Q), while the flavour of product (J) is not significantly different from that of product (H), confirming that "Corral" included in the product before extrusion has no effect on the flavour of the product, after extrusion. Products (K) and (L) also have good quality beef flavours, though that of product (J) is significantly better than that of products (K) and (L) which have flavours of similar quality. Products (M) and (P) have significantly better quality and significantly more persistent flavours on chewing than product (R). Product (M) has a significantly better quality flavour than product (P), while that of product (N) is similar to that of product (P).

WHAT WE CLAIM IS:—

1. A process for preparing a flavouring agent which comprises mixing together one part by weight of a hexose or pentose monosaccharide and from one to twenty parts by weight of a plastein supplemented with a sulphur-containing amino acid, and heating the mixture in the presence of water at a temperature within the range of 80° to 120°C.

2. A process according to claim 1, in which the weight ratio of monosaccharide to supplemented plastein is in the range from 1:4 to 1:10.

3. A process according to claim 2, in which the said ratio is 1:10.

4. A process according to any preceding claim, in which monosodium glutamate is included in the mixture before heating.

5. A process according to claim 4, in which the weight ratio of monosodium glutamate to supplemented plastein is in the range from 1:1 to 1:10.

6. A process according to claim 5, in which the said ratio is 1:5.

7. A process according to any preceding claim in which the amount of water in the mixture before heating is sufficient to provide at least two parts by weight of water for each part of supplemented plastein.

8. A process according to claim 7, in which the monosaccharide used is a pentose and the weight ratio of water to supplemented plastein is about 5:1.

9. A process according to claim 7, in which the monosaccharide used is a hexose and the weight ratio of water to supplemented plastein is about 20:1.

10. A process according to any preceding claim in which the amount of sulphur-containing amino acid in the supplemented plastein is from 5% to 50% by weight based on the supplemented plastein.

11. A process according to claim 10, in which the amount of said amino acid is 15 to 20% by weight of the supplemented plastein.

12. A process according to any preceding claim, in which the sulphur-containing amino-acid used to supplement the plastein is methioine, cysteine, cystine or lanthionine.

13. A process as claimed in claim 1, substantially as hereinbefore described in Example 1.

14. A process as claimed in claim 1, substantially as hereinbefore described in any of Examples 2 to 12.

15. A flavouring agent prepared by a process as claimed in any preceding claim.

16. A meat-flavoured textured protein composition comprising a texture protein having incorporated therein from 0.1 to 10% by weight of a flavouring agent as claimed in claim 15, based on the dry weight of textured protein.

17. A textured protein composition as claimed in claim 16 having incorporated therein from 0.75 to 6% by weight of the flavouring agent as claimed in claim 16.

18. A textured protein composition as claimed in claim 16 or claim 17, which has been prepared by extrusion of a protein composition under super-atmospheric pressure at a temperature above 100°C, the flavouring agent as claimed in claim 15 having been incorporated in the composition before said extrusion.

19. A composition as claimed in any of claims 16 to 18 in which the protein is a vegetable protein.

20. A composition as claimed in claim 19, in which the protein is soya protein.

21. A meat-flavoured textured vegetable protein composition as claimed in claim 15, substantially as described in Example 13.

22. A meat-flavoured textured vegetable protein composition as claimed in claim 15 substantially as described in any of Examples 14 to 17.

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